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NATIONAL DAM INSPECTION PROGRAM. BLUE GIANT MEADOW DAM. (NDI ID--ETC(U)
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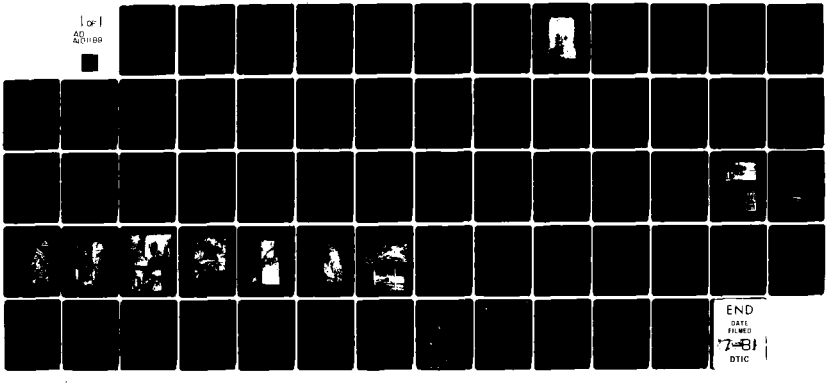

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LEVEL

SUSQUEHANNA RIVER BASIN
TRIBUTARY TO LITTLE WAPWALLOPEN CREEK
LUZERNE COUNTY

PENNSYLVANIA

BLUE GIANT MEADOW DAM

NDI ID No. - PA-00564
DER ID No. - 40-80

SERVICE DEVELOPMENT CORPORATION

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

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SUSQUEHANNA RIVER BASIN

TRIB. TO LITTLE WAPWALLOPEN CREEK, LUZERNE COUNTY

PENNSYLVANIA

BLUE GIANT MEADOW DAM

NDI ID No. PA-00564
DER ID No. 40-80

SERVICE DEVELOPMENT CORPORATION

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

Prepared By:

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

APRIL 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team.

It is important to note the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition, and the downstream damage potential.

BLUE GIANT MEADOW DAM

NDI ID NO. PA-00564, DER ID NO. 40-80

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

CONTENTS

Description	Page
Brief Assessment of General Condition and Recommended Action	iii
SECTION 1 - Project Information.	1
SECTION 2 - Engineering Data	5
SECTION 3 - Visual Inspection.	6
SECTION 4 - Operational Procedures	8
SECTION 5 - Hydrology and Hydraulics	9
SECTION 6 - Structural Stability	11
SECTION 7 - Assessment, Recommendations, and Proposed Remedial Measures.	13

APPENDICES

Appendix	Title
A	Checklist - Visual Inspection.
B	Checklist - Engineering Data.
C	Photographs.
D	Hydrology and Hydraulics.
E	Plates.
F	Geology.

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

BRIEF ASSESSMENT OF GENERAL CONDITION
AND
RECOMMENDED ACTION

Name of Dam: Blue Giant Meadow Dam
NDI ID No. PA 00564
DER ID No. 40-80

Size: Small (12.1 feet high; 160 acre-feet)

Hazard Classification: Significant

Owner: Service Development Corporation
Allentown, Pennsylvania

State Located: Pennsylvania

County Located: Luzerne

Stream: Tributary to Little Wapwallopen Creek

Dates of Inspection: 21 October 1980 & 9 March 1981

The visual inspection and review of available design and construction information indicate that Blue Giant Meadow Dam is in poor condition. Deficiencies noted during the inspection included the poor condition of the spillway, eroded portions of the embankment crest, lack of any operable drawdown facility, and heavy growth of trees and brush on the embankment. In accordance with the recommended guidelines the spillway design flood for this facility is in the range of the 100 year flood to 1/2 the PMF. Based on the size of the dam the selected SDF is the 100 year flood.

The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity cannot pass the Spillway Design Flood (100 year flood) without overtopping the dam. Therefore, in accordance with criteria outlined and evaluated in Section 5.5 of this report, the spillway for Blue Giant Meadow Dam is considered to be inadequate.

BLUE GIANT MEADOW DAM

It is recommended that the owner immediately:

a. Retain a qualified professional engineer to develop remedial measures necessary to rehabilitate the spillway and provide adequate spillway capacity. Protection of the embankment from spillway flows should be included. The engineer should also determine the need for providing a drawdown facility for this dam, and include such remedial work in this plan of improvements if found necessary.

b. The seepage near the right side of the spillway should be monitored and appropriate remedial action taken should the condition worsen significantly.

c. Voids at the downstream toe should be backfilled with suitable material and compacted.

d. Remove trees and brush from the embankment under the guidance of a qualified professional engineer.

e. A formal surveillance and downstream emergency warning system should be developed for use during periods of heavy or prolonged precipitation.

f. An operation and maintenance manual or plan should be prepared for use as a guide in the operation and maintenance of the dam during normal and emergency conditions.

g. A schedule of regular inspections by a qualified engineer should be developed.

APPROVED BY:

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS

James W. Peck

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

DATE: 18 May 81

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

BLUE GIANT MEADOW DAM

NDI ID NO. PA 00564
DER ID NO. 40-80

SECTION 1

PROJECT INFORMATION

1.1 General.

a. Authority. The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspection of non-Federal dams throughout the United States.

b. Purpose. The purpose of this inspection is to determine if the dam constitutes a hazard to human life and property.

1.2 Description of Project.

a. Description of Dam and Appurtenances. Blue Giant Meadow Dam is an earth and rockfill structure approximately 12.1 feet high and 422 feet in length (including spillway). The dam is reported to have an 18 inch wide concrete corewall extending the full length of the embankment. The facility is provided with an uncontrolled, rectangular shaped spillway located near the right abutment. The spillway is a broadcrested weir approximately 32.4 feet in length and 1.8 feet in depth.

There are currently no functional outlet works for this facility.

NOTE: The U.S.G.S. Quadrangle Sheet (Wilkes-Barre West, PA) indicates a reservoir elevation of 1131.0, which is used in this report as existing spillway crest elevation.

b. Location. Wright-Township, Luzerne County
U.S.G.S. Quadrangle - Wilkes-Barre West, PA
Latitude: 41° 08.5' Longitude: 75° 56.8'
Ref. Appendix E, Plates I & II

c. Size Classification. Small: Height - 12.1 feet
Storage - 160 acre-feet

d. Hazard Classification. Significant (Refer to Section 3.1.E)

e. Ownership: Service Development Corporation

Room 206
956 Hamilton Mall
Allentown, Pennsylvania 18101
c/o: Mr. Turney Gratz, Manager

f. Purpose: Future Land Development

g. Design and Construction History: Information on the original design and construction of the dam is very limited. A previous owner (Mr. George L. Fenner, Sr.) reported that the dam was built prior to 1912 and consisted of a concrete corewall reinforced by earthfill upstream and dry stone masonry downstream. Mr. Fenner also reported that "in the mid-1950's a large bulldozer was used to place additional fill behind the dam."

h. Normal Operating Procedure. The reservoir is normally maintained 6 inches below the crest level of the uncontrolled spillway. This is due to erosion of a portion of the spillway crest. Inflow occurring when the lake is above the spillway crest is currently discharged both through the spillway and overtop a low point in the embankment.

1.3 Pertinent Data.

a. Drainage Area (square miles)

From files:	0.10
Computed for this report:	1.38
Use:	1.38

b. Discharge at Damsite (cubic feet per second)

Maximum known flood	unknown
Spillway with maximum pool (El. 1130.9)	10

c. Elevations (feet above mean sea level)

Top of Dam	
Design	unknown
Existing	1130.9
Normal pool (eroded spillway crest)	1130.5
Spillway Crest	
Design	1131.0
Existing	1130.5
Streambed at toe	1118.8

d. Reservoir Length (feet)

Normal pool (El. 1130.5)	1300
Maximum pool (El. 1130.9)	1500

e. Storage (acre-feet)

Normal pool (El. 1130.5)	150
Maximum pool (El. 1130.9)	160

f. Reservoir Surface (acres)

Normal pool (El. 1130.5)	20
Maximum pool (El. 1130.9)	20.2

g. Dam

Note: Refer to exhibits in Appendix A for field sketch, profile and section.

Type: Earth and rockfill with concrete corewall

Length: 422 feet (including spillway)

Top Width: 9 feet, average

Height: 12.1 feet

Side Slopes:

Upstream:	Varies 1V:1H to 1V:2.5H, upper portion; IV:1.4H below
Downstream	Varies 1V:12H for 15 feet horiz. from the crest then 1V:1.5H

Zoning: Rockfill downstream of crest

Cutoff: Corewall (depth unknown)

Grouting: Unknown

h. Spillway

Type: Uncontrolled, rectangular, concrete broad-crested weir

Location: In right portion of dam

Length: 32.4 feet

Crest Elevation: 1130.5 (eroded section)

Freeboard: 0.4 foot

Approach Channel: Reservoir

Downstream Channel: Earth and Rock

SECTION 2

ENGINEERING DATA

2.1 Design. The available data for Blue Giant Meadow Dam consist of files provided by the Pennsylvania Department of Environmental Resources (PennDER). Information available includes state inspection reports, various related correspondence, and a report dated 1 June 1915 which provides a general description of the facility. No other information concerning design of the facility is known to exist.

2.2 Construction. No information is available on the original construction of the dam. An inspection report dated 28 December 1964 indicated that the owner was placing additional fill at the dam and planned to install an outlet pipe for drawdown. There is no evidence that the new pipe was ever installed. Available information indicates that additional fill has been placed on the dam on several occasions.

2.3 Operation. No formal records of operation or maintenance exist, other than a report submitted to PennDER dated 8 June 1936 which provided information relative to spillway flow during the flood of March 1936. The current owner stated that he checks the dam periodically and during storm events. The most recent PennDER inspection report (2 July 1965) indicated that the dam was in generally good condition.

2.4 Evaluation.

a. Availability. All available written information and data were contained in the permit files provided by PennDER.

b. Adequacy. The available data, including that collected during the recent detailed visual inspection, are considered to be adequate to make a reasonable assessment of the dam.

SECTION 3

VISUAL INSPECTION

3.1 Observations.

a. General. The overall appearance and general condition of the dam and appurtenances are poor. Noteworthy deficiencies are described below. The visual inspection checklist and field sketch are provided in Appendix A. Photographs taken during the inspection are reproduced in Appendix C.

The reservoir pool was approximately 0.8 foot below the spillway crest on the day of the initial inspection. Present during this inspection were Turney Gratz of the Service Development Company, owners of the dam and Gerard Gagne of Spotts, Stevens and McCoy, Incorporated, consultants for Service Development Company. On the day of the review inspection, the lake was 0.4 foot below the spillway crest.

b. Embankment. The entire embankment is overgrown with brush and trees, which made inspection difficult. The 9 foot wide crest is irregular with low spots occurring adjacent to the spillway and then generally rising toward the abutments. The apparent cause of the low spots is erosion by flood flows passing behind the spillway walls. This flow is also eroding the adjacent downstream slope. The upstream slope is 1V:1H for two feet below the crest, then 1V:2.5H for a horizontal distance of approximately three feet before steepening to 1V:1.4H below the water line. The downstream face is also irregular and slopes 1V:12H for the first fifteen feet and then 1V:1.5H. These irregular slopes are apparently the result of the random placement of additional earth over the original dam, rather than indications of any instability. However two large voids were found during the review inspection near the toe, just left of spillway. These voids could be probed to a depth of five feet. There is no riprap on the upstream face but erosion does not appear to be a problem except adjacent to the spillway. Approximately one gallon per minute of clear seepage was noted downstream of the right side of the spillway. The source may be the original sluiceway through the dam but rocks totally obscurred the assumed location of the outlet. It should be noted that during the review inspection flow over the spillway prevented a check of this seepage. The dam is reported to contain a concrete corewall, the top of which is visible at the low spot behind the left spillway wall.

c. Appurtenant Structures. The spillway is a broad-crested concrete structure in poor condition located near the right abutment of the dam. A two foot wide by four foot deep breach of the spillway was made in the past in order to lower the lake prior to the placement of additional embankment material. This breach is currently blocked by a concrete plug that is 2 feet by 4 feet by 8 inches thick. This plug appears to be holding satisfactorily. Portions of the crest of the spillway are missing the top six inches of concrete, thus lowering normal pool. The remaining portions are cracked. Further deterioration

is probable. The spillway walls, which are approximately 3 feet thick by 1.8 feet high, extend the width of the crest only. These walls are being undercut adjacent to the spillway crest. In addition, erosion has created a channel behind the walls. The approach to the spillway is the lake and is unobstructed. Flows over the spillway weir discharge onto rocks and into an earth channel. The area immediately downstream of the weir is obstructed with brush and small trees.

No operational outlet works were found during the inspection. A 10-inch diameter cast iron pipe extends through the embankment about 82 feet to the right of the spillway. This pipe is apparently sealed on the upstream end since no flow was observed. The original sluiceway through the spillway could not be found. It is assumed that the upstream end is silted and the downstream end has collapsed or is blocked by the rocks on the downstream side of the spillway.

d. Reservoir Area. The wooded reservoir slopes are flat and appear stable. There is one house along the left side of the lake. Approximately 250 feet upstream of the upper end of the lake is Ice Pond Dam (DER No. 40-79), a significant hazard structure with an inadequate spillway.

e. Downstream Channel. Approximately 50 feet downstream of the spillway the channel bends sharply to the left and flows a short distance before crossing under a two lane road through a five foot diameter corrugated metal pipe. To this point the channel is cut in earth. The channel then flows through a meadow area for about 1,500 feet before becoming confined and joining Little Wapwallopen Creek 3,500 feet downstream of the dam. Approximately 2.5 miles further downstream is Andy Pond. One trailer home is located in the floodplain approximately 300 feet downstream of the dam. The first floor of this structure is approximately 2.5 feet above the spillway crest with about 5 feet of foundation exposed. Failure of Blue Giant Meadow Dam would create the potential for the loss of a few lives and property damage downstream. The downstream development is shown on Plate E-II.

f. Evaluation. The dam has obviously not been maintained for some time. The deteriorating condition of the spillway and the adjacent low spots on the embankment cause concern that this structure will not operate satisfactorily during a flood event. The excessive growth of trees and brush should be removed under the direction of a engineer. The condition of the original sluiceway should be determined and the need for drawdown facilities should be investigated.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Normal Operating Procedure. The facility is essentially self-regulating. Inflow normally passes through the eroded channels in the spillway crest. These channels are 0.4 foot below existing top of dam. Large inflows would begin to overtop the low point on the dam shortly after reaching the eroded spillway crest. No formal operating manual exists.

4.2 Maintenance of Dam. The condition of the dam as observed by the inspection team is indicative of a general lack of maintenance. No maintenance appears to have been performed over the recent past as the embankment has a heavy growth of trees and brush. In addition, the spillway has deteriorated to a point that repairs to the structure should be made. No formal maintenance manual exists.

4.3 Maintenance of Operating Facilities. See section 4.2 above.

4.4 Warning System. No formal warning system exists.

4.5 Evaluation. Routine maintenance of the facility should include removal of trees, brush and high weeds. No means currently exist to lower the elevation of the lake if required for any repair to the structure. Formal manuals of maintenance and operation are recommended to ensure that all needed maintenance is identified and performed regularly. In addition, a formal warning system for the protection of downstream inhabitants should be developed. Included in the plan should be provisions for around-the-clock surveillance of the facility during periods of unusually heavy precipitation.

SECTION 5

HYDROLOGIC/HYDRAULIC EVALUATION

5.1 Design Data. No formal design reports, drawings or calculations are known to exist for the facility.

5.2 Experience Data. Records of reservoir levels and/or spillway discharges are not available. Review of the PennDER files indicate that the March 1936 flood event had a maximum depth of nine inches over the spillway. No other records of past performance are known to exist.

5.3 Visual Observations. On the date of the inspection conditions were observed that would prevent the facility from operating within the capability of the structure. The major problems found were the severe deterioration of the spillway weir and the erosion of the embankment adjacent to the spillway walls.

5.4 Method of Analysis. The facility has been analyzed in accordance with procedures and guidelines established by the U.S. Army Corps of Engineers, Baltimore District, for Phase I hydrologic and hydraulic evaluations. This analysis has been performed using a modified version of a HEC-1 program developed by the U.S Army Corps of Engineers, Hydrologic Engineering Center, Davis, California. Capabilities of the program are briefly outlined in the preface contained in Appendix D.

5.5 Summary of Analysis.

a. Spillway Design Flood (SDF). In accordance with the procedures and guidelines contained in the National Guidelines for Safety Inspection of Dams for Phase I Investigations, the SDF for Blue Giant Meadow Dam ranges between the 100 year flood and one-half the Probable Maximum Flood (PMF). This classification is based on the relative size of the dam (small), and the potential hazard of dam failure to downstream development (significant). Due to the small storage (160 ac. ft.) and height (12.1 feet), the SDF selected was the 100 year flood.

b. Results of the Analysis. Blue Giant Meadow Dam was evaluated under near normal operating conditions. The starting lake elevation was set at 1130.5. The top of embankment (low point) was elevation 1130.9. An upstream dam, Ice Pond Dam, DER No. 40-79, controls 1.23 square miles of the total drainage area of 1.38 square miles.

The 100-year flood peak is derived by averaging the peak flow value obtained from two regression equations. The first regression equation is from Bulletin 13, Floods in Pennsylvania Water Resources Bulletin, Guidelines are provided to determine the peak value by use of regional statistical data. The second regression equation is from the Hydrologic Study, Tropical Storm Agnes, North Atlantic Division, U.S. Army Corps of

Engineers, 1975. Guidelines are provided to determine the flood peak by use of map coefficients and logarithmic equations. The following results are obtained.

100 year flood peak	CFS
Bulletin 13 -	442
North Atlantic Division - Tropical Storm Agnes	1230
Average 100 year flood peak	840

To determine the adequacy of the spillway, the average value for the 100 year flood is compared against the maximum outflow at low point top of dam. If the maximum outflow exceeds the 100 year average peak value derived above, then the spillway is rated adequate. If however, the 100 year average peak value exceeds the maximum outflow at low point top of dam, the spillway is rated inadequate. Results are as follows:

	CFS
Maximum Outflow at low point top of dam	10
Average 100 year flood peak	840

5.6 Spillway Adequacy. Under existing conditions, Blue Giant Meadow Dam, can not pass the 100 year flood peak value. Since this structure can not pass the selected SDF (100 year flood) the spillway is rated inadequate.

SECTION 6

STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability.

a. Visual Observations.

(1) Embankment. The dam is an earth and rockfill structure that reportedly has an 18 inch thick concrete corewall. It appears that the embankment material was randomly dumped and spread since the slopes vary considerably. No seepage, sloughing or other stability problems were found in the embankment. There is no riprap on the upstream slope, and the top 2 feet of the upstream slope is at a slope of 1H:1V. No noticeable erosion of the upstream slope was observed except adjacent to the spillway.

During the review inspection an area near the downstream left side of the spillway was found to have open voids extending 5 to 6 feet into the embankment. This does not appear to be a sign of instability, however. Surface erosion has apparently removed some fill and exposed voids in the original rockfill downstream of the corewall.

(2) Appurtenant Structures. The spillway is a deteriorated concrete structure that is in poor condition. A 2 foot wide by 4 foot deep breached section in the weir is sealed by a concrete plug that is 2 feet by 4 feet by 8 inches. This plug appears to be holding satisfactorily. No seepage or erosion was observed in this area. Erosion of the embankment has occurred adjacent to the left spillway wall, which has resulted in a channel 3 feet wide, 5.5 feet long, and 2 feet deep. Continued erosion may jeopardize the spillway wall. Approximately 1 gpm of clear seepage was observed downstream of the right side of the spillway. This seepage may be from a sluiceway reported to be located in the spillway right side, but the sluiceway could not be observed to verify this. A 10 inch cast iron outlet pipe extends through the embankment approximately 82 feet right of the spillway. This pipe is sealed on the upstream end. Presently, there is no seepage through the pipe.

b. Design and Construction Data.

(1) Embankment. No design or construction data exist; however, some photographs and an inspection report from 1915 provided useful information. The dam was built prior to 1912 by the owner without the aid of plans or engineering supervision. The dam has an 18 inch concrete corewall for the full length of the embankment. Downstream of the corewall the embankment has a substantial rockfill held in place by a dry laid rock wall.

(2) Appurtenances. No design or construction data exist. The 1915 report states, "the spillway is a notch in the concrete corewall". Beneath the spillway, near the right side, there is a 2 foot by 4 foot rock culvert that is blocked on the upstream end.

c. Operating Records. None.

d. Post-Construction Changes. No applications or notifications of changes exist; however, some changes were noted. A cast iron pipe outlet to the right of the spillway was noted in a 1938 inspection to be plugged on the downstream end and had heavy leakage. This pipe may have been installed during original construction, but it was not mentioned in the 1915 report or any other reports prior to 1938. The embankment has been increased in size considerably over the years with added fill. The spillway weir was breached in 1964 to add fill and install an outlet pipe; however, the pipe apparently was never installed.

e. Seismic Stability. The dam is located in Seismic Zone 1. From visual observations, the dam is considered to be statically stable. Therefore, based on the recommended criteria for evaluation of seismic stability of dams, the structure is presumed to present no hazard from an earthquake.

SECTION 7

ASSESSMENT AND RECOMMENDATIONS

7.1 Dam Assessment.

a. Safety. The visual inspection and review of available design and construction information indicate that Blue Giant Meadow Dam is in poor condition. Deficiencies noted during the inspection included the poor condition of the spillway, eroded portions of the embankment crest, lack of any operable drawdown facility, and heavy growth of trees and brush on the embankment. In accordance with the recommended guidelines the spillway design flood for this facility is in the range of the 100 year to 1/2 the PMF. Based on the size of the dam, the selected SDF is the 100 year flood.

The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity cannot pass the SDF (100 year flood) without overtopping the dam. Therefore, in accordance with criteria outlined and evaluated in Section 5.5b, the spillway for Blue Giant Meadow Dam is considered to be inadequate.

b. Adequacy of Information. The available information contained in PennDER files, in conjunction with data collected during visual inspection, are considered to be adequate for making a reasonable assessment of this dam.

c. Urgency. The recommendations presented below should be implemented without delay.

d. Necessity for Additional Studies. The results of this inspection indicate a need for additional investigations to determine measures required to provide adequate spillway capacity for this facililty.

7.2 Recommendations. It is recommended that the owner immediately:

a. Retain a qualified professional engineer to develop remedial measures necessary to rehabilitate the spillway and provide adequate spillway capacity. Protection of the embankment from spillway flows should be included. The engineer should also determine the need for providing a drawdown facility for this dam, and include such remedial work in his plan of improvements if found necessary.

b. The seepage near the right side of the spillway should be monitored and appropriate remedial action taken should the condition worsen significantly.

c. Voids at downstream toe should be backfilled with suitable material and compacted.

d. Remove trees and brush from the embankment under the guidance of a qualified professional engineer.

e. A formal surveillance and downstream emergency warning system should be developed for use during periods of heavy or prolonged precipitation.

f. An operation and maintenance manual or plan should be prepared for use as a guide in the operation and maintenance of the dam during normal and emergency conditions.

g. A schedule of regular inspections by a qualified engineer should be developed.

APPENDIX A

CHECKLIST - VISUAL INSPECTION

Check List
Visual Inspection
Phase I

Name Dam Blue Giant Meadow Dam NDI No. 00564 County Luzerne State Pennsylvania

*Date(s) Inspection 21 Oct 80 Weather Cloudy w/ showers Temperature 50°

Pool Elevation at Time of Inspection 1130.2 M.S.L. Tailwater at Time of Inspection --- M.S.L.

Inspection Personnel:

J. Bianco (COE) E. Hecker (COE), Recorder Turney Gratz, Service Dev. Co.

B. Cortright (COE) H. Reeser (COE) Gerard Gagne, Spotts, Stevens & McCoy, Inc.

J. Evans (COE)

*Review Inspection

Date Inspection 9 Mar 81 Weather Cloudy Temperature 45°

Pool Elevation 1130.6 M.S.L Tailwater 1118.9

Personnel:

J. Bianco (COE) B. Cortright (COE) P. Maggitti (COE)

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS
Any noticeable seepage	About 1 gpm near toe of spillway; clear
Junction of Embankment With: Abutments Spillway	Abutment junctions good. Low spots adjacent to spillway walls eroded to top of corewall
Surface Cracks	None observed; excessive vegetation made thorough inspection impossible
Crest Alignment: Vertical Horizontal	Low spot adjacent to left spillway wall. Also low at right wall. Elsewhere rising toward abutments Horizontal - Good
Unusual Movement or Cracking at or Beyond the Toe	None. Variable slope & vegetation made inspection difficult

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS
Sloughing or Erosion: Embankment Crest/Slopes Abutment Slopes	D/s slope is irregular due to random placement of fill. Erosion of low spot at and d/s of crest. Voids near d/s toe, left of spillway
Riprap	None
Staff Gage	None
Instrumentation	None
Miscellaneous	Overgrown w/trees and brush

OUTLET WORKS AND SPILLWAY

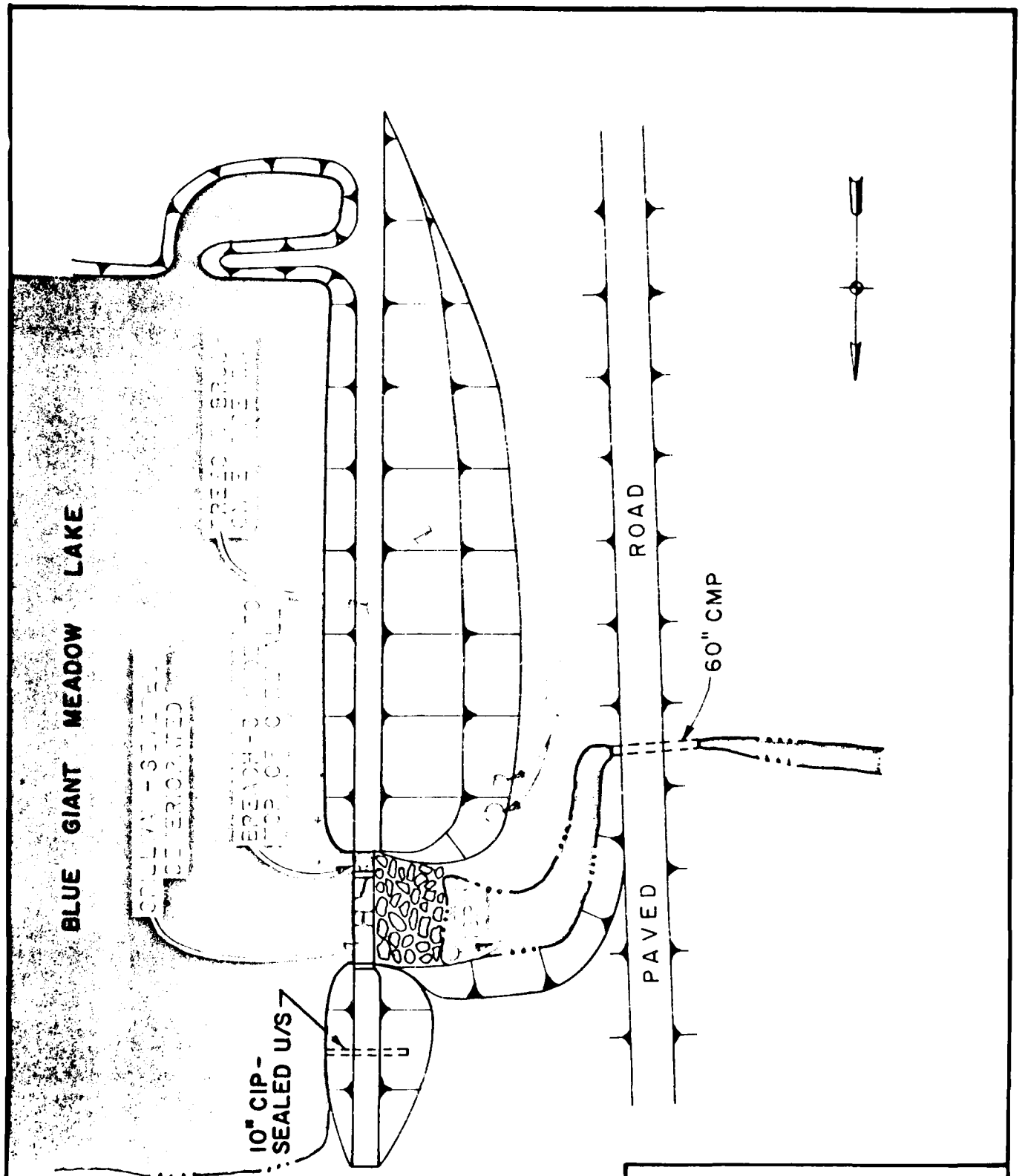
VISUAL EXAMINATION OF	OBSERVATIONS
Outlet Works	None apparent. Original rock culvert through spillway not found. 10 inch C.I.P plugged u/s.
Spillway Approach Channel	Reservoir; clear
Spillway Crest	Concrete surface deteriorating; top 6" gone in some areas. 2' wide x 4' deep breach through crest; plugged by 8" thick concrete. Walls being undercut and flanked.
Bridge and Piers	None
Discharge Channel	Rock pile on d/s side of crest; then earth lined. No spillway walls d/s of crest.

RESERVOIR AREA

VISUAL EXAMINATION OF	OBSERVATIONS
Slopes	Flat; wooded
Sedimentation	None

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS
Condition (Obstructions Debris Other	Rock bottom near dam. 5 foot culvert immed. d/s. Through meadow for 1,500 feet; then confined. Joins Little Wapwallopen Creek 3,500 feet d/s; 2.5 miles to Andy Pond.
Slope	Flat to moderate
Approximate Number of Homes	One trailer home on exposed foundation 300' d/s of dam.



NOT TO SCALE

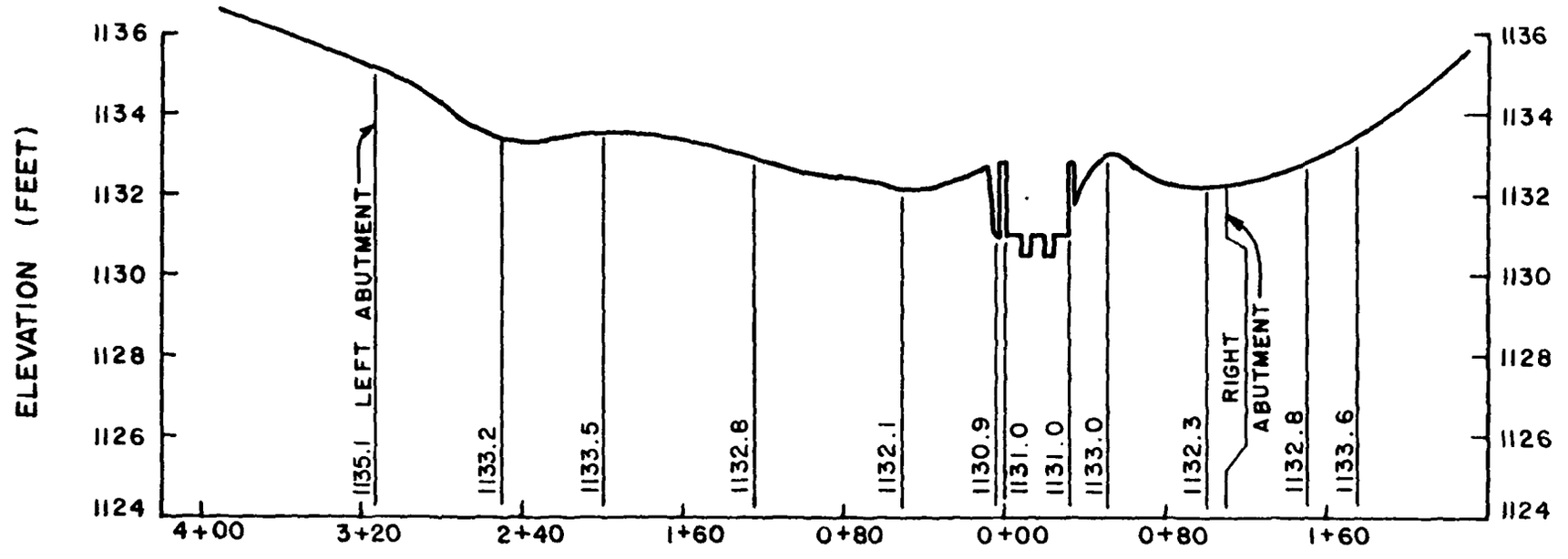
PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

BLUE GIANT MEADOW LAKE DAM

SERVICE DEVELOPMENT CORP.

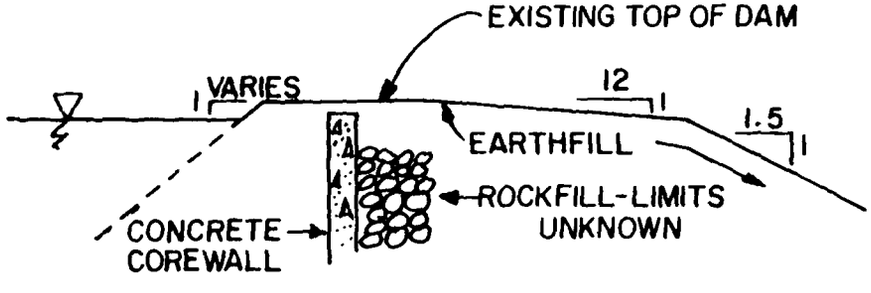
FIELD SKETCH

MAY 1981 EXHIBIT A - 1



TOP OF DAM - PROFILE

SCALE - HORIZ.: 1 IN. = 80 FT.
VERT. : 1 IN. = 4 FT.



SECTION
NO SCALE

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

BLUE GIANT MEADOW LAKE DAM

SERVICE DEVELOPEMENT CORP.

PROFILE AND SECTION

MAY 1981

EXHIBIT A-2

APPENDIX B

CHECKLIST - ENGINEERING DATA

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE 1

NAME OF DAM BLUE GIANT MEADOW DAM

ID # 40-80

ITEM	REMARKS
AS-BUILT DRAWINGS	None
REGIONAL VICINITY MAP	U.S.G.S. Wilkes-Barre West, Pa. Quadrangle, 7 1/2 minute quad sheet. See Appendix E, Plate E-II.
CONSTRUCTION HISTORY	The dam was built prior to 1912 by the owner without plans or engineering supervision. Dam has 18" corewall. Reinforced by earthfill.
TYPICAL SECTIONS OF DAM	None
OUTLETS - PLAN DETAILS CONSTRAINTS DISCHARGE RATINGS	No data. A 10 inch C.I.P. sealed on upsteam end located 82 feet right of spillway.
RAINFALL/RESERVOIR RECORDS	None

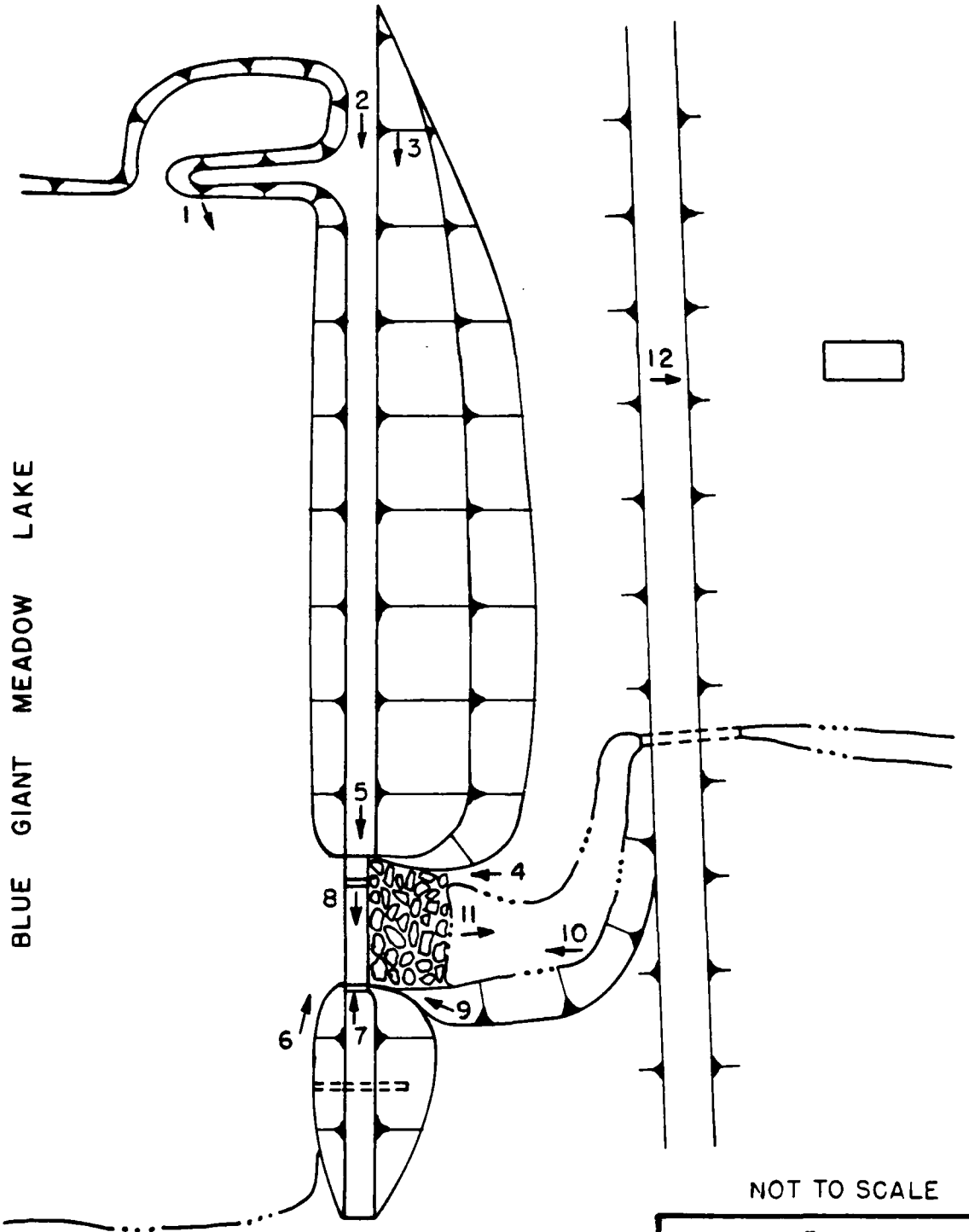
ITEM	REMARKS
DESIGN REPORTS	None
GEOLOGY REPORTS	None
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None
POST-CONSTRUCTION SURVEYS OF DAM	None reported.
BORROW SOURCES	No data.

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	No modifications applies for. Earthfill has been added at various times.
HIGH POOL RECORDS	None
POST-CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None reported.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	N/A
MAINTENANCE OPERATION RECORDS	None

ITEM	REMARKS
SPILLWAY PLAN	None
SECTIONS	
DETAILS	
OPERATING EQUIPMENT PLANS & DETAILS	N/A
SPECIFICATIONS	No data
MISCELLANEOUS	Inspection reports by Water and Power Resources Board (Penn DER).

APPENDIX C

PHOTOGRAPHS



NOT TO SCALE

← LOCATION AND ORIENTATION OF CAMERA
5 - PHOTOGRAPH IDENTIFICATION NUMBER

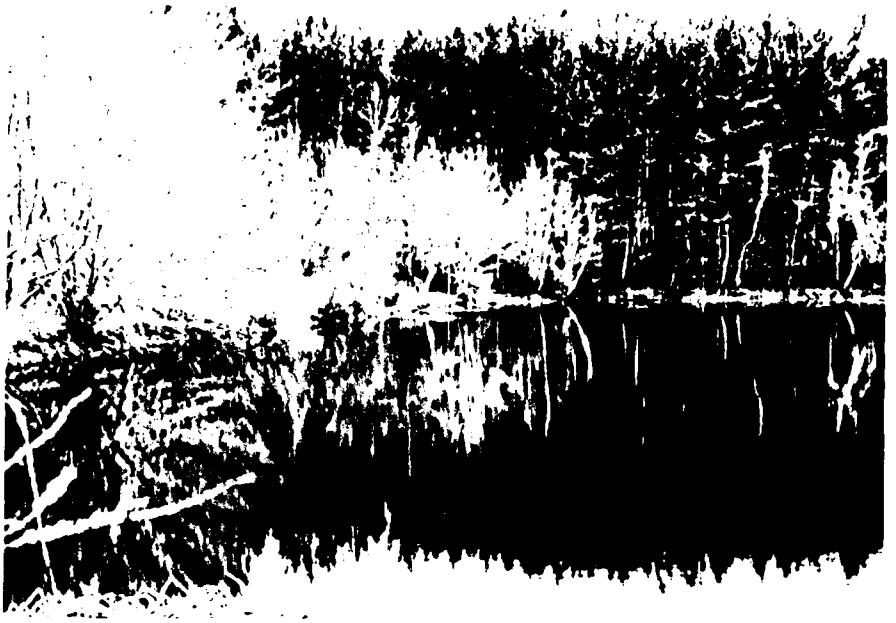
PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

BLUE GIANT MEADOW LAKE DAM

SERVICE DEVELOPMENT CORP.

PHOTOGRAPH LOCATION PLAN

MAY 1981 EXHIBIT C-1



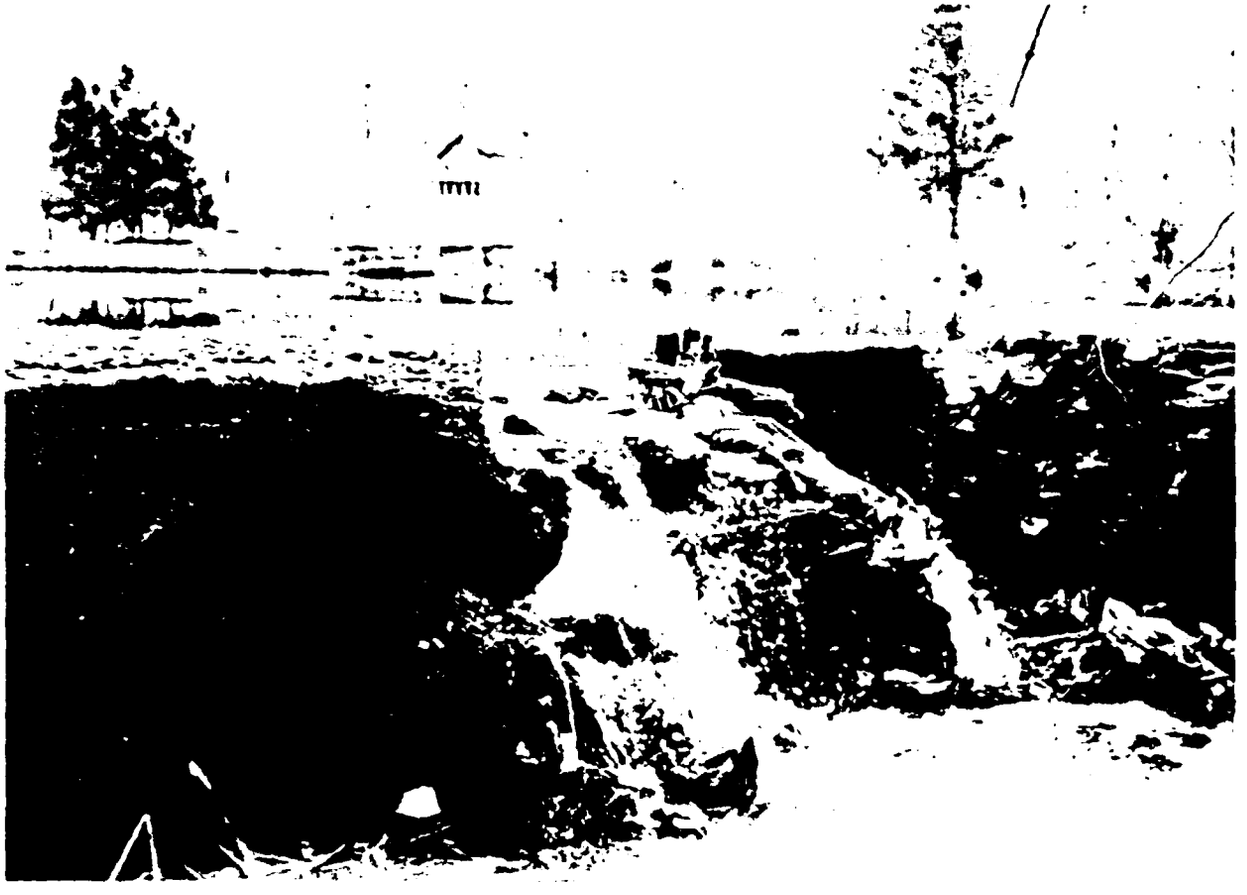
1. Upstream face and right abutment.

2. Dam crest.

6. Spillway crest and walls on 7 Oct 80.

7. Spillway crest and walls. Note deterioration of crest and undercutting of walls.

8. Auxiliary crest and right wall. Concrete pool in foreground.



9. Downstream face of spillway with flow through low spots in eroded crest.

[illegible] Meadow Dam - NDI No. 00564

11. Downstream channel with 5 foot diam culvert at left.

12. Downstream hazard.

APPENDIX D

HYDROLOGY AND HYDRAULICS

PREFACE

The modified HEC-1 program is capable of performing two basic types of hydrologic analyses: 1) the evaluation of the overtopping potential of the dam; and 2) the estimation of the downstream hydrologic-hydraulic consequences resulting from assumed structural failures of the dam. Briefly, the computational procedures typically used in the dam overtopping analysis are as follows:

a. Development of an inflow hydrograph(s) to the reservoir.

b. Routing of the inflow hydrograph(s) through the reservoir to determine if the event(s) analyzed would overtop the dam.

c. Routing of the outflow hydrograph(s) from the reservoir to desired downstream locations. The results provide the peak discharge(s), time(s) of the peak discharge(s), and the maximum stage(s) of each routed hydrograph at the downstream end of each reach.

The evaluation of the hydrologic-hydraulic consequence resulting from an assumed structural failure (breach) of the dam is typically performed as shown below.

a. Development of an inflow hydrograph(s) to the reservoir.

b. Routing of the inflow hydrograph(s) through the reservoir.

c. Development of a failure hydrograph(s) based on specified breach criteria and normal reservoir outflow.

d. Routing of the failure hydrograph(s) to desired downstream locations. The results provide estimates of the peak discharge(s), time(s) to peak and maximum water surface elevations of failure hydrographs for each location.

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEADOW DAM SHEET 1 OF SHEETS

COMPUTED BY JRB CHECKED BY DATE 2-11-81

DAM CLASSIFICATION:

SIZE OF DAM - SMALL
HAZARD - SIGNIFICANT
REQUIRED SDF - 100 YEAR FLOOD TO ½ PMF

DAM STATISTICS:

HEIGHT OF DAM - 12.1 FEET
STORAGE AT NORMAL POOL - 150 AC-FT
STORAGE AT TOP OF DAM - 160 AC-FT.
DRAINAGE AREA ABOVE DAMSITE - 1.38 mi^2

ELEVATIONS: (MSL)

TOP OF DAM LOW POINT (FIELD) - 1130.9
NORMAL POOL - 1130.5
STREAMBED AT CENTERLINE OF DAM - 1118.8
SPILLWAY CREST - 1131.0 (ORIGINAL CREST)
- 1130.5 (FIELD LOW POINT)

HYDROGRAPH PARAMETERS:

RIVER BASIN - SUSQUEHANNA RIVER BASIN
ZONE - 13
SYNDER COEFFICIENTS
C_p - 0.50
C_t - 1.85

MEASURED PARAMETERS: *

L = LENGTH OF LONGEST WATERCOURSE L = 1.14 mi
L_{CA} = LENGTH OF LONGEST WATERCOURSE TO CENTROID OF THE BASIN L_{CA} = 0.208

NOTE: ICE POND DAM IMMEDIATELY UPSTREAM CONTROLS 1.23 mi^2 OF THE TOTAL DRAINAGE AREA. L & L_{CA} ARE BASED ON THE SMALL UNCONTROLLED PORTION ABOVE BLUE GIANT

* - FROM U.S.G.S. QUAD SHEET, WILKES BARRE WEST, PA.
7½ MINUTE SERIES SCALE 1:24000

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEDOW DAM SHEET 2 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 2-11-81

NOTE: ELEVATIONS ARE REFERENCED TO U.S.G.S. QUAD SHEET ENTITLED WILKES BARRE WEST, PA., ELEVATION GIVEN ON QUAD SHEET IS 1131 WHICH WILL BE ASSUMED TO BE AT NORMAL POOL.

t_p = SYNDERS BASIN LAG TIME TO PEAK IN HOURS

NOTE SINCE the CENTROID IS ADJACENT TO THE LAKE.

$t_p = C_t (L')^{0.6}$ ... where L' = Longest length into the reservoir, miles

$t_p = 1.85(0.57)^{0.6} = 1.32$ hours $L' = 0.57$ miles

RESERVOIR CAPACITY:

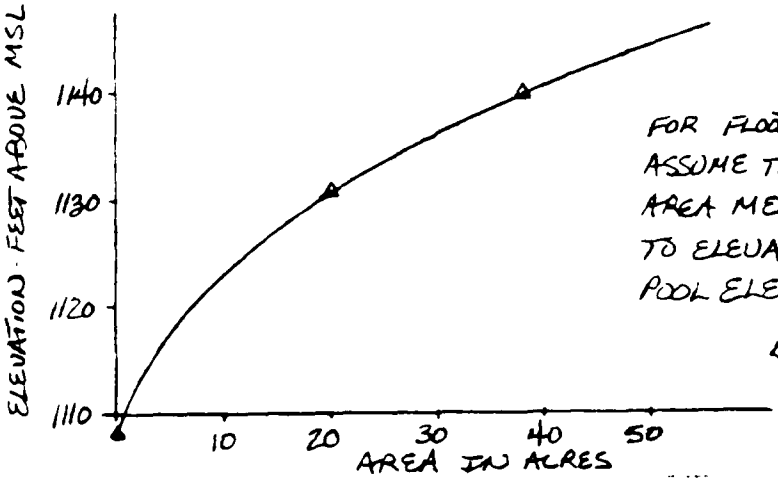
- SURFACE AREA AT NORMAL POOL (1130.5) - 20 ACRES
- SURFACE AREA AT ELEVATION 1140.0 - 38 ACRES
  (PLAINIMETERED VALUES)

ASSUME CONICAL METHOD APPLIES TO FIND LOW POINT IN POOL, BELOW NORMAL POOL.

VOLUME AT NORMAL POOL - 150 AC-FT.
(FROM DER FILES)

$V = \frac{1}{3}AH$; $H = \frac{3V}{A} = \frac{3(150 \text{ AC-FT})}{(20 \text{ ACRES})} = 22.5$ FEET

∴ ZERO STORAGE AT ELEVATION 1130.5 − 22.5 = 1108.0



FOR FLOOD ROUTING PURPOSES ASSUME THE AVERAGE END AREA METHOD IS SUITABLE TO ELEVATIONS ABOVE NORMAL POOL ELEVATION AND

$\Delta V = \frac{(A_1 + A_2)}{2} \Delta H$

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEADOW DAM SHEET 3 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 2-11-81

ELEVATION STORAGE TABLE:

ELEVATION (MSL)	AREA (ACRES)	ΔH (FT)	$\Delta V = \frac{(A_1 + A_2)}{2} \Delta H$ (AC-FT)	CUMULATIVE VOLUME (AC-FT)
1108.0	0	—	—	0
1130.5	20	NORMAL POOL		150.0
1130.9 (TOD)	20.2	0.4	8.0	158.0
1131.3	20.5	0.4	8.1	166.0
1132.0	22.0	0.7	14.9	181.0
1133.0	24.0	1.0	23.0	204.0
1134.0	26.0	1.0	25.0	229.0
1135.0	28.0	1.0	27.0	256.0
1140.0	38.0	5.0	165.0	421.0

*TOD = TOP OF DAM

NOTE DRAINAGE AREA ABOVE DAM IS 1.38 mi^2 WITH 1.23 mi^2 CONTROLLED BY ICE POND DAM, APPROXIMATELY 1200 FEET UPSTREAM OF BLUE GIANT MEADOW LAKE DAM.

ELEVATION (MSL)	STORAGE (AC-FT.)
1108.0	0
1130.5	150
1130.9 (TOD)	160
1131.3	190
1132.0	180
1132.0	200
1134.0	230
1135.0	260
1140.0	420

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEADOW DAM SHEET 4 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 2-11-81

SDF: BASED ON THE SMALL HEIGHT OF DAM AND THE SMALL STORAGE, THE SDF SELECTED FOR THIS POND WAS THE 100 YEAR FLOOD. THIS IS IN ACCORDANCE WITH THE GUIDENCE PROVIDED.

∴ USE SDF = 100 YEAR FLOOD

PMP CALCULATIONS:

SINCE THE SDF SELECTED FOR THIS POND HAS BEEN THE 100 YEAR FLOOD, NO CALCULATIONS ARE NECESSARY TO COMPUTE THE PROBABLE MAXIMUM PRECIPATATION (PMF) OR THE PROBABLE MAXIMUM FLOOD (PMF).

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEDOW DAM SHEET 5 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 2-11-81

EMERGENCY SPILLWAY CAPACITY:

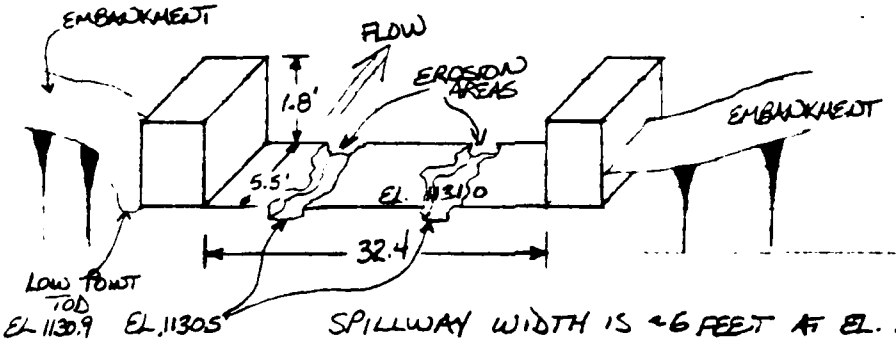
NOTE: SPILLWAY IS LOCATED IN RIGHT PORTION OF DAM. SEE FIELD SKETCH IN APPENDIX A, EXHIBIT 1.

SPILLWAY DATA

TYPE- BROAD CRESTED, ~ 5.5 FEET WIDE
LENGTH - 32.4 feet
CREST ELEVATION - 1131.0 (ORIGINAL), 1130.5 (EROSIONAL LOW POINT)
LOW POINT TOP OF DAM - 1130.9
SPILLWAY FREEBOARD - 0.4 FEET TO TOP OF DAM LOW POINT
1.80 feet to TOP OF SPILLWAY WALLS
C VALUE - 2.85 for spillway
2.85 for embankment

NOTE: THESE C VALUES WILL BE USED BASED ON WIDTH PARALLEL TO FLOW, SPILLWAY 5.5 FEET, EMBANKMENT ~ 9 FEET. THESE VALUES WILL BE HELD CONSTANT FOR ALL HEADS.

SPILLWAY SKETCH:



SPILLWAY WIDTH IS ~6 FEET AT EL. 1130.5 WITH 0.4 FEET FREEBOARD PRIOR TO OVERTOPPING LOW POINT OF EMBANKMENT AT ELEVATION 1130.9, SPILLWAY WIDTH IS ORIGINAL VALUE OF 32.4 FEET PRIOR TO EROSION IN CONCRETE PAD.

NOTE: SEE PHOTOGRAPHS IN APPENDIX C. THESE EROSION CHANNELS HAVE CREATED A LOW FLOW NOTCH IN THE SPILLWAY.

NAOB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEDOW DAM SHEET 6 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 2-12-87

SALLWAY RATING CURVE :

L = 6 FEET AT EL 1130.5
C = 2.85, L = 26.4 feet AT AND ABOVE EL 1132

POOL ELEVATION (MSL)	H HEAD (FEET) LOW FLOW	H HEAD (FEET) SPILLWAY	Q (CFS) LOW FLOW	Q (CFS) SPILLWAY	ROUNDED Q (CFS) LOW FLOW	ROUNDED Q (CFS) SPILL	TOTAL Q (CFS)
1130.5	0	-	0	-	0	-	0
1131.0	0.5	0	6.0	0	10	0	10
1132.0	1.5	1.0	31.4	75.2	30	75	105
1133.0	2.5	2.0	67.5	212.6	70	210	280
1134.0	3.5	3.0	112.0	391.0	110	390	500
1135.0	4.5	4.0	163.2	601.9	160	600	760
1140.0	9.5	9.0	500.6	2031	500	2030	2530

$Q = CLH^{3/2}$ FOR DISCHARGE VALUES

* TOD = TOP OF DAM AS SURVEYED, LOW POINT

EMBANKMENT RATING CURVE :

THIS ANALYSIS ASSUMES THAT THE EMBANKMENT BEHAVES AS A BROAD CRESTED WEIR IF OVERTOPPING OCCURS. THIS DISCHARGE CAN BE ESTIMATED BY:

$$Q = CLH_w^{3/2}$$

WHERE:

Q = DISCHARGE OVER EMBANKMENT, IN CFS

L_1 = LENGTH OF EMBANKMENT, FT.

H_w = WEIGHTED HEAD, IN FEET, AVERAGE FLOW AREA WEIGHTED ABOVE LOW POINT OF DAM

C = COEFFICIENT OF DISCHARGE

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEADOW DAM SHEET 7 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 2-12-81

LENGTH OF EMBANKMENT INNUNDATED VS. RESERVOIR ELEVATION:

RESERVOIR ELEVATION (MSL)	EMBANKMENT LENGTH (FT)
1130.9 (TOD)	0
1132.0	6
1133.0	200
1134.0	350
1135.0	390 *
1140.0	390 *

EMBANKMENT RATING TABLE:

RESERVOIR ELEVATION (MSL)	L_1 (FT)	L_2 (FT)	INCREMENTAL HEAD (FT) H_i	① INCREMENTAL FLOW AREA, A_i (FT^2)	TOTAL FLOW AREA, A_T (FT^2)	② WEIGHT HEAD, H_ω (FT)	③ Q (CFS)
1130.9	0	-	-	-	-	-	0
1132.0	6	0	1.1	3.3	3.3	0.55	7
1133.0	200	6	1.0	103.0	106.3	0.53	220
1134.0	350	200	1.0	275.0	381.3	1.09	1135
1135.0	390	350	1.0	370.0	751.3	1.92	2951
1140.0	390	390	5.0	1950.0	2701.3	6.92	20233

① - $A_i = H_i[(L_1+L_2)/2]$

② - $H_\omega = A_T/L_1$

③ - $Q = CL_1H_\omega^{3/2}$

recall $C = 2.85$ FROM SHEET 5 OF THIS APPENDIX.

* MAXIMUM LENGTH OF EMBANKMENT NOT INCLUDING OVERBANK AREAS OR SPILLWAY WIDTH.

LENGTH OF DAM 422 - SPILLWAY LENGTH 32 = 390 FEET

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE _____

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEDOW DAM SHEET 8 OF _____ SHEETS

COMPUTED BY JPB CHECKED BY _____ DATE 2-12-87

TOTAL FACILITY RATING CURVE:

RESERVOIR ELEVATION (MSL)	$Q_{SPILLWAY}$ (CFS)	$Q_{EMBANKMENT}$ (CFS)	Q_{TOTAL} (CFS)
1130.5	0	0	0
1130.9 (TOD)	8	0	8
1131.0	10	0	10
1132.0	105	10	115
1133.0	280	220	500
1134.0	500	1140	1640
1135.0	760	2960	3720
1140.0	2530	20230	22760

NOTE: SMALL 4'x2' NOTCH IN SPILLWAY WILL BE IGNORED FOR THE FACILITY RATING CURVE.

DATA FOR ICE POND DAM - THE DAM IMMEDIATELY UPSTREAM CAN BE FOUND IN DAM SAFETY INSPECTION REPORT ON THAT DAM. ICE POND DAM DER'S NUMBER IS:

ICE POND DAM - 70-40-49

100 YEAR FLOOD ANALYSIS:

THE SELECTED SDF FOR BLUE GIANT MEDOW LAKE DAM HAS BEEN THE 100 YEAR FLOOD. THIS IS BASED ON THE SIZE OF THE DAM AND THE HAZARD CATAGOREY OF THE DAM.

TO DEVELOP THE 100 YEAR FLOOD, TWO REGRESSION EQUATIONS WILL BE USED TO DETERMINE THE PEAK VALUE. THE AVERAGE OF THE TWO REGRESSION PEAKS WILL BE THE 100 YEAR FLOOD PEAK USED IN THIS ANALYSIS.

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEADOW DAM SHEET 9 OF SHEETS

COMPUTED BY JRB CHECKED BY DATE 4-24-81

BULLENTIN 13 FLOOD PEAK:

FROM PLATE 1 - BLUE GIANT MEADOW DAM IS IN REGION 5

THEREFORE, THE REGRESSION EQUATION IS:

$$Q_T = cA^x P_i^p$$

where:

Q_T = PEAK FLOW FOR RETURN PERIOD T, IN YEARS
c = REGRESSION CONSTANT
A = DRAINAGE AREA IN SQUARE MILES
x = REGRESSION COEFFICIENT
P_i = ANNUAL PRECIPITATION INDEX = AVERAGE ANNUAL EXCESS PRECIPITATION WHICH EQUALS AVERAGE ANNUAL PRECIPITATION MINUS ESTIMATED POTENTIAL ANNUAL EVAPOTRANSPIRATION
p = REGRESSION COEFFICIENT

FROM PLATE #2: AVERAGE ANNUAL PRECIPITATION = 42 INCHES
POTENTIAL ANNUAL EVAPOTRANSPIRATION - 25 INCHES

$\therefore P_i = 42 - 25 = 17$

recall $A = 1.38 mi^2$

FOR 100 YEAR ANALYSIS:

$c = 42.2$ $\quad P_i = 17$
$x = 0.751$ $\quad A = 1.38$
$p = 0.744$ $\quad T = 100$

THEREFORE, $Q_T = cA^x P_i^p$

$$Q_{100} = 42.2(1.38)^{0.751}(17)^{0.744} = 442.4 cfs$$

$Q_{100} = 442.4$ cfs FROM BULLENTIN 13

NOW, COMPUTE THE 100 YEAR FLOOD PEAK FROM HYDROLOGIC STUDY - TROPICAL STORM AGNES, NORTH ATLANTIC DIVISION 1975

$$\text{LOG}(Q_m) = C_m + 0.75 \text{Log}(A)$$

where: C_m = a map COEFFICIENT FOR MEAN LOG OF ANNUAL PEAK
Q_m = GEOMETRIC MEAN OF ANNUAL FLOOD PEAKS IN CFS
A = DRAINAGE AREA, mi^2

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE _____

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS BLUE GIANT MEDOW DAM SHEET 10 OF _____ SHEETS

COMPUTED BY JPB CHECKED BY _____ DATE 2-12-87

$$\text{Log}(Q_m) = C_m + 0.75\,\text{Log}(A)$$

recall $A = 1.38\ mi^2$

FROM FIGURE 21, $C_m = 2.00$

$$\therefore \text{Log}(Q_m) = 2.00 + 0.75(\log(1.38))$$

$$\log(Q_m) = 2.1049$$

NOW, COMPUTE THE STANDARD DEVIATION

$$S = C_S - 0.05 \log(A)$$

where: S = STANDARD DEVIATION OF THE LOGARITHMS OF THE ANNUAL PEAKS

C_S = a map COEFFICIENT FOR STANDARD DEVIATION

A = DRAINAGE AREA, mi^2

$\therefore$ FROM FIGURE 22 $C_S = 0.38$

$$S = 0.38 - 0.05(\log(1.38))$$

$$S = 0.3730$$

NOW, COMPUTE THE 100 YEAR FLOOD PEAK FROM THE FOLLOWING:

$$\text{Log}(Q_{(P)}) = \log(Q_m) + K(P,g)S$$

where: $\text{Log}(Q_{(P)})$ = Log OF THE ANNUAL FLOOD PEAK FOR A GIVEN EXCEEDENCE FREQUENCY (P)

$\text{Log}(Q_m)$ = MEAN LOGARITHM OF ANNUAL FLOOD PEAK

$K(P,g)$ = STANDARD DEVIATE FOR A GIVEN EXCEEDENCE FREQUENCY (P) AND SKEW COEFFICIENT (g)

S = STANDARD DEVIATION, LOGS OF ANNUAL FLOOD PEAKS

$\therefore$ WE NEED TO KNOW SKEW COEFFICIENT, FROM FIGURE 23

$$g = 0.43$$

$\therefore$ INTERPOLATED VALUE FROM CHART (EXHIBIT 39 - STATISTICAL METHODS IN HYDROLOGY - LEO BEARD - U.S. ARMY CORPS OF ENGINEERS - JAN 1962)

NADB FORM 1232, 28 MAR 74

* $K(P,g) = 2.64$ 0.6 - 2.77
0.4 - 2.62

$$\text{Log}(Q_{100}) = \text{Log}(Q_m) + K(P,g)s$$
$$\text{Log}(Q_{100}) = 2.1049 + 2.64(0.3730)$$
$$= 3.08962$$
$$Q_{100} = 1230 \text{ cfs}$$

THEREFORE, $Q_{100} = 1230$ cfs FROM TROPICAL STORM AGNES REPORT, NORTH ATLANTIC DIVIS.

NOW, COMPUTE THE 100 YEAR FLOOD PEAK BY AVERAGING THE TWO REGRESSION PEAKS.

$$\therefore Q_{100} = \frac{442.4 + 1230}{2} = 836.2 \text{ cfs}$$

$$\therefore Q_{100} \approx 840 \text{ cfs}$$

SPILLWAY ADEQUACY:

THE SPILLWAY IS CONSIDERED ADEQUATE IF THE MAXIMUM OUTFLOW THROUGH THE SPILLWAY AT LOW POINT TOP OF DAM IS GREATER THAN THE Q_{100} PEAK CALCULATED ABOVE.

THEREFORE,

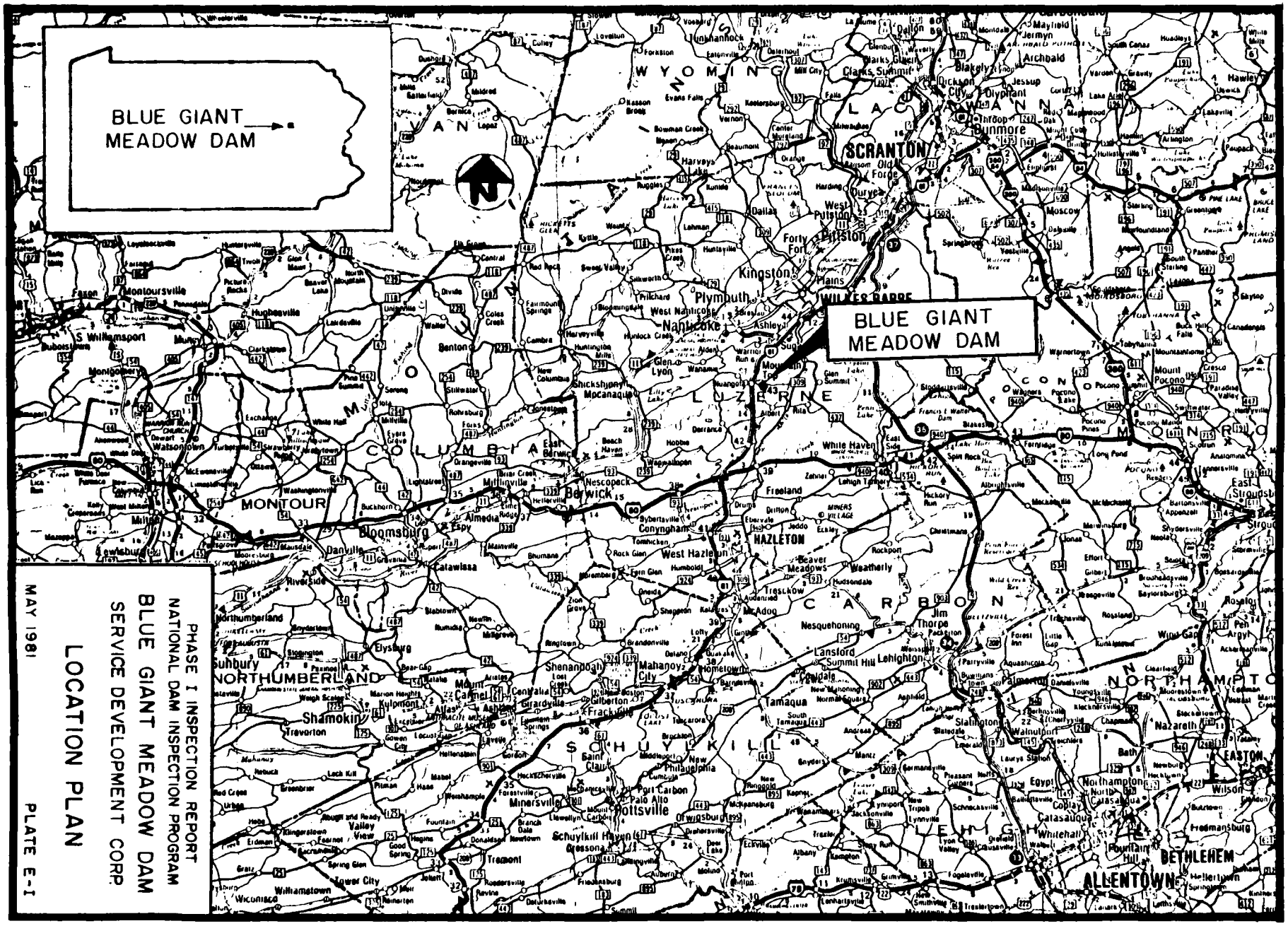
MAXIMUM OUTFLOW AT TOP OF DAM = 10 CFS
MAXIMUM INFLOW FOR 100 YEAR FLOOD = 840 CFS

SINCE THE MAXIMUM INFLOW IS GREATER THAN THE MAXIMUM OUTFLOW, THE SPILLWAY IS RATED INADAQUATE

NADB FORM 1232, 28 MAR 74

APPENDIX E

PLATES



PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

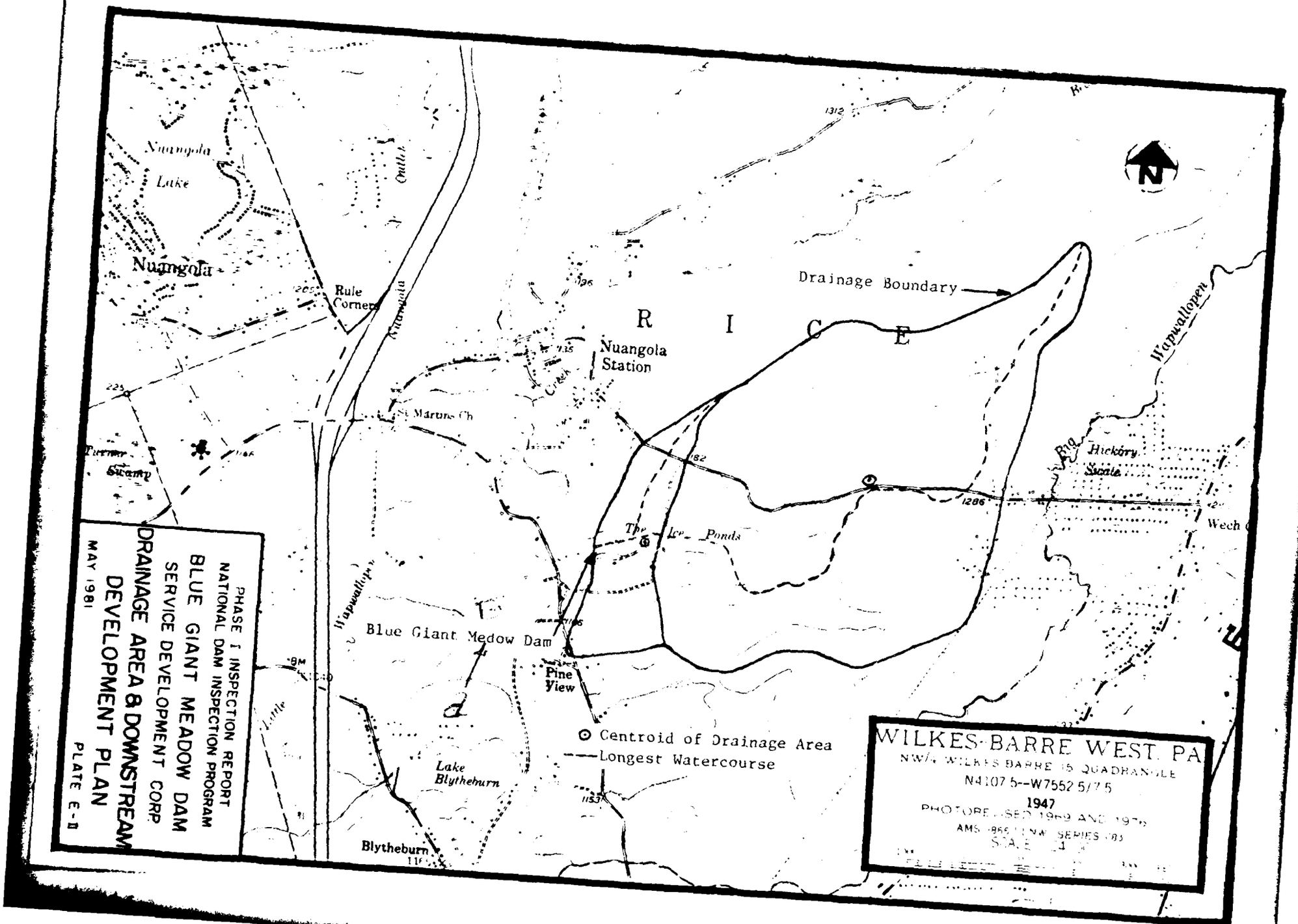
BLUE GIANT MEADOW DAM

SERVICE DEVELOPMENT CORP.

LOCATION PLAN

MAY 1981

PLATE E-I


Nuangola Lake
Nuangola
Rule Corners
Nuangola Station
Drainage Boundary
R I C E
Wapwallopen
Big Hickory Swale
Blue Giant Meadow Dam
Pine View
Centroid of Drainage Area
Longest Watercourse
Lake Blytheburn
Blytheburn
Tierney Swamp
St Martins Ch
PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
BLUE GIANT MEADOW DAM
SERVICE DEVELOPMENT CORP.
DRAINAGE AREA & DOWNSTREAM
DEVELOPMENT PLAN
MAY 1981
PLATE E-II
WILKES-BARRE WEST, PA
NW/4 WILKES-BARRE 15 QUADRANGLE
N4107.5--W7552.5/7.5
1947
PHOTOREVISED 1969 AND 1978
AMS 8856 II NW SERIES V883
SCALE 1:24000

APPENDIX F

GEOLOGY

BLUE GIANT MEADOW DAM

GENERAL GEOLOGY

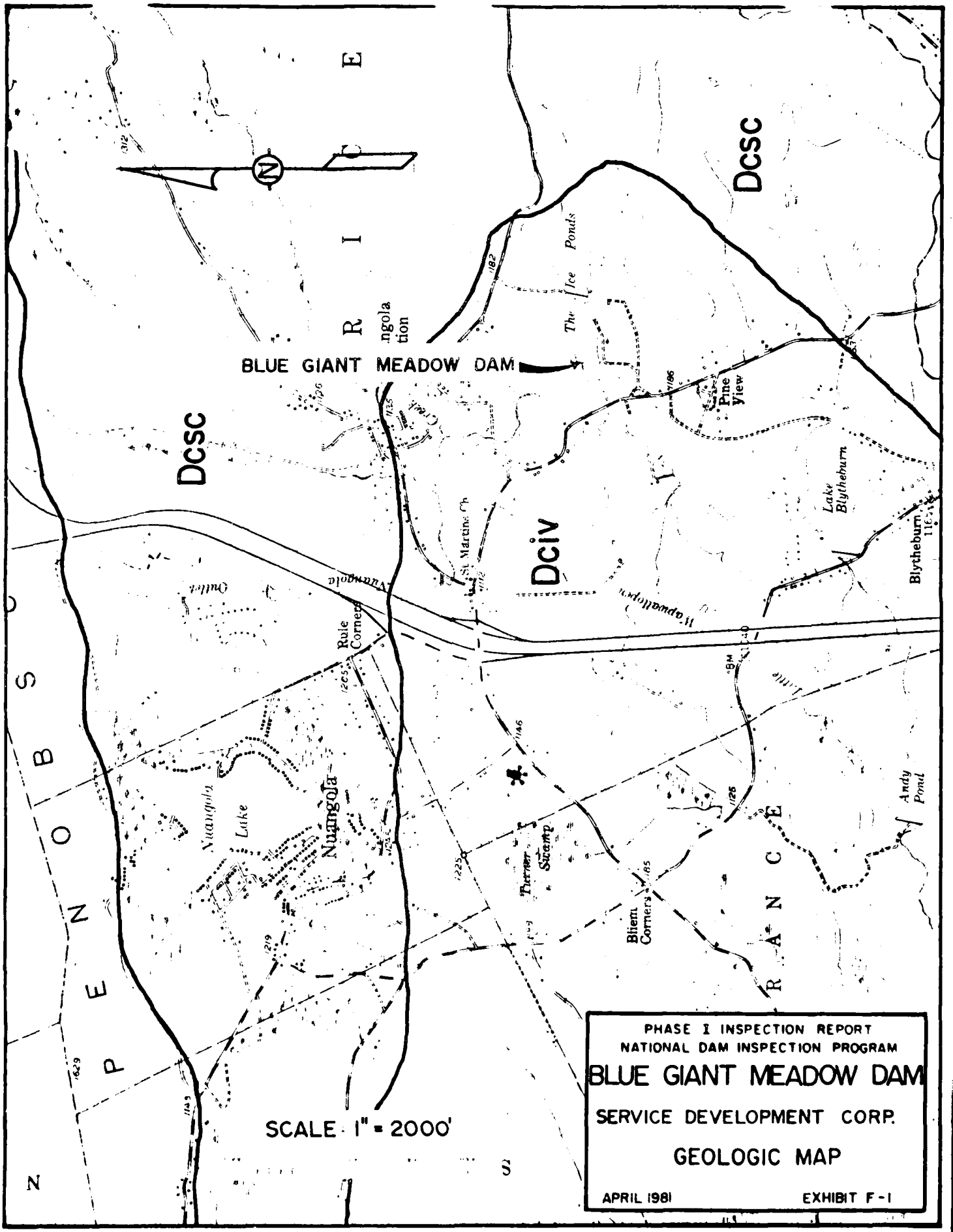
The bedrock at Blue Giant Meadow Dam is the Irish Valley Member of the Catskill Formation. This member consists of marine and nonmarine siltstone interbedded and grayish-red sandstone and claystone. Late Wisconsinian glacial drift, probably till, is believed to overlie the bedrock at this site. The thickness of drift is probably less than 2m, but locally it may be thicker, particularly to the northeast of Ice Pond.

LEGEND

(Bedrock)

Dcsc CATSKILL FORMATION, SHERMAN CREEK MEMBER - Alternating grayish-red siltstone and claystone in poorly defined, fining-upward cycles, and minor intervals of gray sandstone; laterally equivalent to Berry Run, Sawmill Run, Packerton, and Long Run Members.

Dciv CATSKILL FORMATION, IRISH VALLEY MEMBER - Light-olive-gray marine siltstone interbedded with nonmarine, gray and grayish-red sandstone and grayish-red claystone, arranged in fining-upward cycles.


BLUE GIANT MEADOW DAM
Dcsc
Dcsc
Dciv
Pine View
Lake Blytheburn
Blytheburn
Rule Corners
Nuangola
Nuangola Lake
Turner Swamp
Bliem Corners
Andy Pond
The Ice Ponds
St Martins Ch
Outlet
SCALE 1" = 2000'
N
S
PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
BLUE GIANT MEADOW DAM
SERVICE DEVELOPMENT CORP.
GEOLOGIC MAP
APRIL 1981
EXHIBIT F-1